



S/N 09/710,472

PATENT

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: SUGIMOTO ET AL. Examiner: J. GONZALEZ  
Serial No.: 09/710,472 Group Art Unit: 2834  
Filed: NOVEMBER 10, 2000 Docket No.: 10873.600US01  
Title: PIEZOELECTRIC ELEMENT AND MOBILE COMMUNICATION DEVICE  
USING THE SAME

CERTIFICATE UNDER 37 CFR 1.10:

"Express Mail" mailing label number: EV168361708US  
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By:

Name:

*John Junkers*

RESPONSE

Box Non-Fee Amendment  
Commissioner for Patents  
Washington, D.C. 20231



Dear Sir:

In response to the Office Action mailed on June 10, 2002, please enter the following remarks. Claims 1-15 are pending in the application.

The drawings were objected to under 37 C.F.R. 1.83(a) for not showing every feature of claim 1. Applicants submit that all of the features of claim 1 are shown in Figures 1A-1C as described below.

Referring to Figures 1A to 1C of the current application, there is shown a substrate 11, a first electrode 12a, and a second electrode 12b. The end in the longitudinal direction of the exciting electrode 12a (first electrode) corresponds to an edge 12ae. The end in the longitudinal direction of the exciting electrode 12b (second electrode) corresponds to an edge 12be. The normal line of the edge 12ae (line that is perpendicular to the edge 12ae) is represented by a symbol "A" in Figure 1A. The normal line of the edge 12be (line that is perpendicular to the edge 12be) is represented by a symbol "B" in Figure 1B.

Figures 1A and 1B are plan views of principal planes 11a and 11b, respectively, which are positioned relative to each other as shown in Figure 1C. The side wall 11c is parallel to the

side wall 11d. Furthermore, an angle formed by the side wall 11c and the direction of symbol "A" ("a normal line of an edge in the longitudinal direction of the first exciting electrode"), and an angle formed by the side wall 11d in the direction "B" ("a normal line of an edge in the longitudinal direction of the second exciting electrode") are both represented by a symbol " $\gamma$ " ( $\gamma \neq 0$ ). The direction of symbol "A" in Figure 1A is parallel to the direction of symbol "B" in Figure 1B. Thus, Figures 1A-1C show all of the limitations of claim 1.

Claims 1-15 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. In response to the Examiner's questions, Applicants refer to the above description of Figures 1A-1C. Further, the "longitudinal direction" readily would be understood to refer to a direction generally along the length L of the substrate and "transverse direction" to a direction generally across a width W of the substrate. A "normal line of an edge in the longitudinal direction" would be understood to refer to a line that extends in a normal (perpendicular) direction relative to an edge (such as edge 12ae or edge 12be), wherein the normal line extends generally in the longitudinal direction L. The direction of the "normal lines" is represented by symbols "A" and "B" shown in Figures 1A and 1B. In view of the above, Applicants submit that the claims are definite. Withdrawal of the rejection is requested.

Claims 1-3 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugimoto et al., U.S. Patent No. 6,243,933, in view of Tanaka, U.S. Patent No. 5,446,429. Applicants respectfully traverse this rejection.

The piezoelectric element of claim 1 requires that a normal line of an edge (direction "A" or direction "B") is nonparallel to a side wall (11c or 11d) of the piezoelectric substrate. When thickness shear vibration occurs in the piezoelectric element, this nonparallel configuration of an edge of an exciting electrode relative to a side wall of the piezoelectric substrate is advantageous for the purpose of suppressing undesired spurious signals. The Sugimoto and Tanaka references disclose elements in which the line normal to an edge of an electrode is parallel to a side wall of a piezoelectric substrate and therefore do not provide the advantages of the non-parallel configuration required by claim 1 (See electrode 72 in Figure 19A of Sugimoto and electrodes 3 and 4 in Figure 1 of Tanaka). Sugimoto is directed to arranging the polarization axes of crystal plates to which electrodes are secured relative to crystalline axes of the plates (col. 5, lines 36-47). Tanaka is directed to positioning various electrodes (earth, earth terminal, first and second excitation electrodes) and lead lines relative to each other on a piezoelectric substrate so as to prevent undesirable vibration in certain areas of the substrate (col. 2, line 26 to col. 3, line 5). Therefore, neither Sugimoto nor Tanaka disclose or suggest the elements of claim 1. Applicants

respectfully submit that claim 1, and the claims that depend from it, are allowable over the cited references. Withdrawal of the rejection is respectfully requested.

Claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugimoto and Tanaka and further in view of Mandai et al., U.S. Patent No. 6,064,351. Claims 4-7 and 10-13, were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugimoto and Tanaka as applied to claims 3 and 9 above, and further in view of Yabe et al., U.S. Patent No. 6,023,973, and ordinary skill in the art. As discussed above, claim 1 is allowable over the Sugimoto and Tanaka references. The Mandai et al., Yabe et al. and ordinary skill in the art fail to remedy the deficiencies of Sugimoto and Tanaka. Therefore, claims 4-7, 10-13, and 15 are allowable for at least the reason they are dependent upon an allowable base claim. Applicants do not concede the correctness of these rejections.

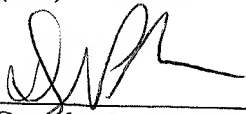
The Examiner has asserted that the method of making the device required by claims 8 and 14 is not germane to the issue of patentability of the device itself. Applicants traverse the Examiner's subsequent decision to withdraw claims 8 and 14 from consideration. Even if the "method of making" features have no impact on the properties of the product itself, this does not change the fact that claims 8 and 14 are product claims and thus should be examined with the other product claims. It may well be that Applicants will have to show the significance of the "method" aspect to the product, before the "method" aspects would be considered to impact patentability. However, this does not support a decision to withdraw the claims from consideration. Claims 8 and 14 are allowable for at least the same reasons as the independent claims. Applicants are not conceding that claims 8 and 14 have no additional basis for patentability. Applicants therefore request consideration of claims 8 and 14.

In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.

Respectfully submitted,

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Date: September 10, 2002



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